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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,769	12/02/2003	Stuart M. Lindsay	MOL 0077 PA/40518.112	3836

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EXAMINER	
LIVEDALEN, BRIAN J	
ART UNIT	**PAPER NUMBER**
2878	

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/725,769	LINDSAY ET AL.	
	Examiner	Art Unit	
	Brian J. Livedalen	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 02 December 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 12, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Yasuda et al. (US 6459088).

Regarding claims 1, 12, and 13, Yasuda discloses a scanning microscope including a probe (column 3, line 64), and a stage (102) having at least one axis of translation and means for causing displacement of the stage relative to the probe (column 3, lines 9-12 and 62-column 4, line 14). Yasuda further discloses an actuator (106) for driving the stage (102) (figure 5, column 6, lines 37-39).

Regarding claim 2, Yasuda discloses at least one actuator element (621) that supports the stage (611) and a sine wave generator for actuating the at least one actuator (figure 14, column 12, 43-48).

Regarding claim 4 and 14, Yasuda discloses driving the stage at resonant frequency relative to the probe (column 5, 16-20).

Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Marchman (US 5811796).

Regarding claims 1 and 11, Marchman discloses a scanning microscope including a probe (column 5, line 22), and a stage (27) having at least one axis of translation and means for causing displacement of the stage relative to the probe (column 5, lines 57-column 6 line 24). Marchman further discloses the stage (disc, 27)) being made out of a ceramic material (fig 2A, column 6, lines 32-37).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al. (US 6459088) in view of Shirai et al. (US 6229607).

Regarding claim 3, Yasuda discloses at least one actuator element (621) for causing displacement of the sample and supporting the stage. Yasuda does not disclose four actuators displacing the sample and supporting the stage. However, Shirai does disclose four actuators (123 and 133) that displace the stage (fig 3, column 7, lines 32-38). It would have been obvious to one of regular skill in the art at the time the invention was made to include the four actuators of Shirai to the scanning microscope of Yasuda because the four actuators allow the stage to be displaced in both the x and y direction and provide greater support to the stage.

Claims and 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al. (US 6459088) in view of Shirai et al. (US 6229607) as applied to claim 3 above, and further in view of Wakui (JP 085176).

Regarding claims 5 and 6, Yasuda in view of Shirai discloses a stage with four actuators. Yasuda in view of Shirai does not disclose the four actuators being located at the four corners of the stage. However, Wakui discloses a stage with four actuators, one at each corner forming a parallelogram shape (fig 5, 1, 3A and 3B, abstract). It would have been obvious to one of regular skill in the art at the time the invention was made to include the actuator placement of Wakui to the stage of Yasuda in view of Shirai because placing the actuators at the corners increases stability.

Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al. (US 6459088) in view of Shirai et al. (US 6229607) and Wakui (JP 085176) as applied to claim 5 and 6 above, and further in view of Erlings (US RE37560).

Regarding claim 7, Yasuda in view of Shirai and Wakui disclose a stage displaced by actuators. Yasuda in view of Shirai and Wakui is silent regarding the actuators being electrically in parallel. Erlings teaches that piezoelectric stacks are commonly used in displacing a stage for a scanning microscope (column 1, lines 17-30). Piezoelectric stacks are piezoelectric elements mechanically in a series arrangement and electrically in a parallel arrangement. It would have been obvious to one of regular skill in the art at the time the invention was made to include the actuators

being in parallel of Erlings to the translational stage of Yasuda in view of Shirai and Waiku because the resulting stacks are effective for large displacements.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al. (US 6459088) in view of Erlings (US RE37560).

Regarding claim 8, Yasuda discloses a translational stage displace by piezoelectric actuator (106). Yasuda remains silent regarding the actuator being a stack bending element. Erlings teaches that piezoelectric stacks are commonly used in displacing a stage for a scanning microscope (column 1, lines 17-30). . It would have been obvious to one of regular skill in the art at the time the invention was made to include the stack actuators of Erlings to the translational stage of Yasuda because the resulting stacks are effective for large displacements.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al. (US 6459088) in view of Zdeblick (US 4906840).

Regarding claim 9, Yasuda discloses at least one piezoelectric actuator (106) (fig 5, column 6, line 44). Yasuda is silent regarding a pzt bimorph actuator. However, Zdeblick discloses a pzt bimorph actuator (cantilever, fig 9) that actuates the tip of a probe (column 2, lines 43-48). It would have been obvious to one of regular skill in the art at the time the invention was made to include the pzt bimorph actuator of Zbedlick to the stage of Yasuda to apply the precise movement of Zbedick's probe to the motion of the stage.

Claim 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al. (US 6459088) in view of Shirai et al. (US 6229607) as applied to claim 3 above, and further in view of Zdeblick (US 4906840).

In regard to claim 10, Yasuda in view of Shirai discloses a stage with four piezoelectric actuators. Yasuda in view of Shirai is silent regarding a pzt bimorph actuator. However, Zdeblick discloses a pzt bimorph actuator (cantilever, fig 9) that actuates the tip of a probe (column 2, lines 43-48). It would have been obvious to one of regular skill in the art at the time the invention was made to include the pzt bimorph actuator of Zbedlick to the stage of Yasuda in view of Shirai to apply the precise movement of Zbedick's probe to the motion of the stage.

Claim 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al. (US 6459088) in view of the publication of Ando et al (A High-Speed Atomic Force Microscope for studying biological macromolecules).

Regarding claim 5, Yasuda discloses a stage that is displaced at a resonant frequency. Yasuda is silent regarding the stage having a resonant frequency at 1/100th of the probe's frequency. Ando teaches the actuator of a scanner having a resonant frequency at 8.5 kHz, 34 kHz, and 100 kHz (paragraph entitled: Imaging Bandwidth). Ando further discloses the probe having a resonant frequency of 2.5 MHz (paragraph entitled: Discussion). This range provided for the ratio of frequencies is provides about 1/100th. It would have been obvious to one of regular skill in the art at the time the

invention was made to actuate the stage and probe of Yasuda in a relationship taught by Ando to increase the imaging bandwidth.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Livedalen whose telephone number is (571) 272-2715. The examiner can normally be reached on 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bjl

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